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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,998	04/25/2006	Gary Ng	US030435US	7251

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EXAMINER	
MEHTA, PARIKHA SOLANKI	
ART UNIT	PAPER NUMBER
3737	

MAIL DATE	DELIVERY MODE
05/08/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,998	NG, GARY	
	Examiner	Art Unit	
	PARIKHA S. MEHTA	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 December 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 April 2006* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because the boxes shown in Figure 4 are not adequately labeled; the reference numerals are not sufficiently descriptive to accurately and completely depict the invention. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7, 9-13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack et al. (US Patent No. 6,179,780), hereinafter Hossack ('780), of record, in view of Burns et al (US PG Pubs. No. 2001/0039381), hereinafter Burns ('381), of record.

Regarding claims 1, 9 and 11, Hossack ('780) teaches an ultrasonic imaging system (see abstract) comprising: a probe (12) including a probe comprising a transducer array (12); a transmit beamformer (16) coupled to elements of the transducer array (see fig. 1) and controlled to cause the probe

to transmit two or more beams during the same transmit interval in different beam directions (see col. 1, l. 41-44 and 59-60), wherein, each beam occupies a substantially different bandwidths of the transducer band (see col. 2, l. 5-6; col. 4, l. 55-62; note that "substantially different" is a subjective and relative term given little patentable weight); a receive beamformer (18) coupled to process two or more receive beams (see col. 4, l. 62-64) in response to the transmitted beams during the same receive interval (see col. 3, l. 48-49; col. 4, l. 8-9), the receive beams exhibiting steering directions corresponding to those of the transmitted beams (see fig. 7); a filter coupled to the beamformer which acts to filter the receive beams (26); a signal processor coupled to the filter and an image processor coupled to the signal processor (see col. 2, l. 18-22: the 3-D processor of D1 comprises both signal and image processors); and a display (22) coupled to the image processor (see fig. 1) which displays an image formed from components of the receive beams (see col. 3, l. 16-17).

Hossack ('780) do not expressly teach the probe to comprise a single crystal transducer array exhibiting a transducer band.

In the same field of endeavor, Burns ('381) teaches a diagnostic ultrasonic imaging system employing a single crystal transducer. It is well known in the art that single crystal transducers have a greater bandwidth than conventional transducers. Accordingly, it would have been obvious to one of ordinary skill in the art to have modified Hossack ('780) to use single crystal transducers instead of conventional transducer elements, in order to improve the bandwidth of the probe, and to thereby improve the resolution of the system.

Regarding claim 2, Hossack ('780) teaches that the transmit beamformer further comprises a pulse encoder which acts to cause the probe to transmit differently coded transmit pulses in the different beam directions (see col. 3, l. 53-56 and fig. 1, ref. sign 24 and 26).

Regarding claim 3, Hossack ('780) teaches that the pulse encoder comprises one of a chirp pulse encoder, a Barker code encoder, or a Golay code encoder (see col. 4, l. 14 and 31-35).

Regarding claims 4 and 7, Hossack ('780) teaches that the filter as comprising bandpass filters exhibiting passbands corresponding to the different bandwidths, and as having a phase response which complements the phase characteristic of the anticipated receive signal (see col. 3 lines 62-65 and col. 4, l. 62-64).

Regarding claims 5, 6 and 12, Hossack ('780) teaches that the filter comprises two or more matched filters matched to the characteristics of the transmitted beams (see col. 3, l. 58-62 and col. 4, l. 7-26).

Regarding claim 10, Burns ('381) teaches a bandpass filter (paragraph 19).

Regarding claims 13 and 14, Hossack ('780) teaches that the beamformer comprises a multiline beamformer (see col. 3, l. 4-12 and fig. 5).

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hossack ('780) in view of Burns ('381) and further in view of Chiao et al. (6,558,328), hereinafter Chiao ('328), of record.

Hossack ('780) and Burns ('381) do not explicitly teach mismatched filters. In the same field of endeavor, Chiao ('328) teaches mismatched filters as being advantageous for improving filtering and promoting unwanted sidelobe suppression (see col. 9. l. 7-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include mismatched filters in the invention of Hossack ('780) and Burns ('381), in view of the teachings of Chiao ('328).

Response to Arguments

5. Applicant's arguments with respect to claims 1-14 have been considered but are not persuasive. Applicant argues that neither Hossack ('780) nor Burns ('381) teach a single crystal transducer transmitting beams with substantially different bandwidths. Examiner maintains that the teaching of Hossack ('780) of a transducer transmitting beams with different center frequencies coupled with the teaching of Burns ('381) to use a single crystal transducer, which is known in the art to operate at a greater bandwidth, does in fact yield the claimed invention. Examiner also notes that the claims do not recite any elements concerning broad band ultrasound transmission, so Applicant's arguments directed to such have no bearing on the present claims. Furthermore, "substantially different" is a highly relative and subjective term and therefore not given significant patentable weight.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rafter (US Patent No. 6,425,869) teaches a broadband single crystal ultrasound transducer, and also teach that single crystal transducers provide improved sensitivity (i.e., resolution) and bandwidth for transducer design.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Parikha S Mehta/
Examiner, Art Unit 3737

/BRIAN CASLER/
Supervisory Patent Examiner, Art Unit 3737